

Docket No.: 49657-274

AF 2811
PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of

Eiji HASUNUMA, et al.

Serial No.: 09/227,935

Filed: January 11, 1999



Group Art Unit: 2811

Examiner: S. Loke

For: SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEROF

REPLY BRIEF

Assistant Commissioner for Patents
Washington, DC 20231

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This Reply Brief is filed under 37 CFR 1.193(b)(1) in response to the Examiner's Answer, dated October 11, 2000. Appellant reasserts all arguments contained in the Principal Brief.

Pages 3 and 4 of the Examiner's Answer appear to restate the rejection of record in more detail.

Pages 5 through 8 of the Examiner's Answer are directed to the arguments presented in the Principal Brief.

Appellant takes issue with the inference at page 5 of the Answer that the Kuroda structure includes a connection hole piercing the element isolation region, as required by claim 1. The term "element isolation region" is a well known term in integrated circuit technology that defines an oxide layer or the like that is formed between adjacent elements to isolate the active regions of the elements from each other. In structures in which cells are paired to share impurity regions and connections, the element isolation region isolates pairs of adjacent cell elements.

Throughout the disclosure of this application, and consistent with accepted terminology, the

term "element isolation region" has been applied to describe the film 2 of the invention illustrated in Fig. 1, as well as the film 2 of the prior art Fig. 15. Kuroda, also consistent with this terminology, identifies film 11 as an element isolation region that isolates adjacent cell pairs from each other. Film 30 of Fig. 5, which the Examiner's Answer conveniently calls an "element isolation region" is not an element isolation region in accordance with the accepted meaning of the term in the art, nor with the meaning ascribed thereto in appellant's disclosure, nor with the meaning ascribed thereto by Kuroda. Kuroda identifies film 11 as an interlayer insulating film (column 8, line 8).

There has been no allegation by the Examiner that Kuroda teaches or suggests piercing the element isolation region 11 to form an interconnection with an underlying impurity region as recited in claim 1. In the absence of such teaching, the Examiner must explain why the interconnection structure of Kuroda would have suggested applicability to the prior art structure of Fig. 15 of the present application. It is submitted that the Examiner's recognition that the connection hole of Kuroda pierces an interlayer insulating film above the substrate surface is not sufficient to conclude that a person of ordinary skill in the art would have been impelled to apply the Kuroda disclosure to the connection hole of prior art Fig. 15, which pierces the element isolation region to connect with the substrate below the substrate surface.

Page 7 of the Examiner's Answer maintains the position that the single impurity region 12 of prior art Fig. 15 is readable on the first and second impurity region portions recited in claim 1 and purports that it is "well known in the art that a single impurity region can be divide [sic] into multiple impurity regions." Appellant takes issue with these statements. It is submitted that the Examiner has the burden of identifying a prior art teaching to support his "divide into multiple impurity region" theory. Without regard to any teaching of specific prior art context, the statement that a single region can be divided into multiple regions is merely an impermissible hindsight application of a "whole is

equal to the sum of its parts" analogy in order to discount the meaning of the claim language. Kuroda does not disclose, nor has it been relied upon for teaching, the impurity region recitation of claim 1.

It is again submitted that the Examiner has improperly ignored the requirement in claim 1 for a first and second impurity region portion. The Examiner need only look to the disclosure to find that these two region portions are distinct, each with its own significance, and formed in a different process step. The fact that claim 1 does not recite the specific shapes of the two portions or other differences therebetween does not broaden the claim recitation to eliminate the requirement for two region portions, each having a particular relevant significance that evidences a distinction from the other.

The permissible scope of claim recitation, or degree of claim specificity to which a claim is bound, is impacted by the prior art. If, as in the present case, there has been no prior art disclosure of two impurity region portions as recited in claim 1, appellant is not constrained to recite a specific shape and impurity concentration of each region portion. While the prior art need not necessarily disclose the specific configuration exemplified in the present invention, or recognize the same problem that the invention has overcome, in order for the rejection to be tenable there must be a prior art teaching of a two portion impurity region portion structure as recited in claim 1. In the absence of such prior art teaching, it is submitted that the Examiner simply (and improperly) broadened his reading of the claim language to be readable on a single impurity region.

In summary, claim 1 recites device structure that differs significantly from the prior art Fig. 15 structure in at least two important respects: the recitation of sidewall film in the connection hole that pierces the element isolation region, and the two portion substrate impurity region recitation. The record does not establish that consideration of Kuroda in light of the structure of Fig. 15 would have led the artisan to implement a modified structure that encompasses the claimed features.

Reversal of the rejection of claims 1, 2 and 4 again is respectfully solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Gene Z. Robinson", followed by a long, sweeping horizontal stroke.

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